

Service Manual

 **PIONEER®**



The photo shows the model EQ-E303 (BK)/US

**ORDER NO.
CRT 1016**

COMPONENT CAR STEREO GRAPHIC EQUALIZER

EQ-E303(BK)

US

EQ-E303

EW, ES

SPECIFICATIONS

Power source 14.4V DC (10.8 — 15.6V allowable)
Grounding system Negative type
Dimensions 150(W)×25(H)×148(D) mm
Weight 0.7kg
Equalization frequency 60Hz, 125Hz, 250Hz, 500Hz,
1kHz, 3.5kHz, 10kHz
Gain -2 dB
Equalization range ±12 dB
Frequency response 20 — 30,000Hz (±3 dB)

Distortion 0.06% (1kHz, 70mV)
Signal-to-noise ratio 85 dB (IHF-A network)
Input impedance 22kΩ
Output impedance Less than 1kΩ
Max. output level 200mV/1kHz, 1% THD

Note:

Specifications and the design are subject to possible modification without notice due to improvements.

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1. NAME OF PARTS AND USE

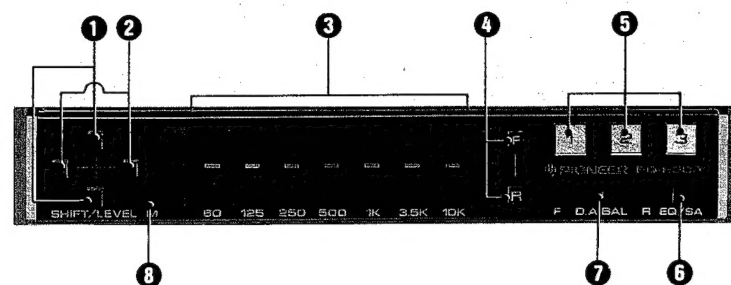


Fig. 1

① Level UP/DOWN Buttons

Adjust the level of the graphic equalizer to the desired setting. While the graphic equalizer indicator is flashing, press the UP button to raise the level and the DOWN button to lower the level.

② Frequency Shift Buttons

Switches the frequency of the graphic equalizer. While the graphic equalizer display is flashing, press the right button to raise the frequency and the left button to lower the frequency.

③ Level Indicator

A 7-step indicator that lights when the level UP/DOWN buttons are operated. The status of each frequency level can thus be determined at a glance. A strong level is shown in red while a weak level is indicated by green. The volume at each frequency is shown on the analyzer display.

④ Equalizer Front/Rear Buttons

Press one button to apply the equalizer function to either the front or rear speaker. Press both buttons to apply the equalizer function to both front and rear speakers.

⑤ Equalizer Preset Button

Equalizer settings can be assigned to preset memories 1 through 3 for later retrieval when required. (The number shown on the button will light when the button is pressed.)

⑥ Equalizer/Spectrum Analyzer Control

Switches between equalizer and spectrum displays.

⑦ Dual Amp Balance Control

Selects either front or rear speakers for a 2-amp 4-speaker system. Set to F for the front speaker and R for the rear speaker.

⑧ Mode/Memory Button

Press to cause the level indicator to blink for approximately 20 seconds. During this time the frequency can be switched and the level adjusted. Press again to cause all of the level indicators to blink for approximately 5 seconds. During this time the equalizer curve can be preset to a memory button.

Creating an Equalizer Curve

Before attempting operation

- Press the equalizer front/rear button ① and ensure that F or R is lit. (Press the equalizer rear button for 2-speaker systems.)
- 1. Press the mode/memory button ②. (A frequency level indicator will blink for approximately 20 seconds.) Perform the following procedures while the level indicator is blinking to adjust the equalizer level.
- 2. Press either the right or left frequency shift button ③ to select the desired frequency.
- 3. Press either the UP or DOWN level UP/DOWN button ④ to adjust to the desired level.
- Repeat steps 2 and 3 to adjust the other frequencies.
- Approximately 20 seconds after level adjustment the indicator will stop flashing. Press the mode/memory button ② again to change the adjusted level.

Using the Memory

Once an equalizer curve is created, the following operation can be used to assign it to a preset memory button.

4. Press the mode/memory button ②. (All of the level indicators will flash for approximately 5 seconds.)
 5. While the level indicators are flashing, press one of the equalizer preset buttons ⑤.
- Up to three equalizer curves can be preset to memory by repeating the steps above.
 - The spectrum analyzer display will be shown when both F and R of the equalizer front/rear button ① are extinguished.
 - Pressing the mode/memory button ② will switch to the equalizer display even when the spectrum analyzer is displayed. A short while after adjustments are made the spectrum analyzer display will return.

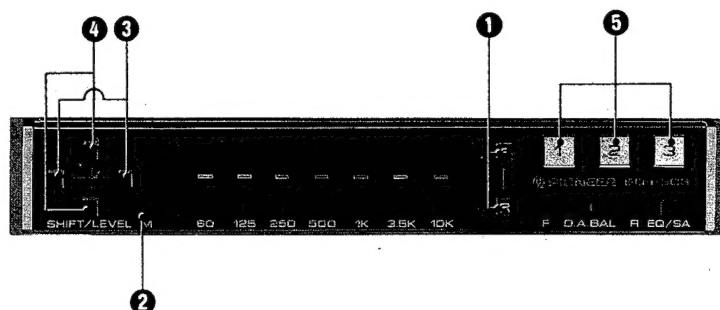


Fig. 2

2. PARTS LOCATION

- For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.

★ ★: GENERALLY MOVES FASTER THAN ★.

This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

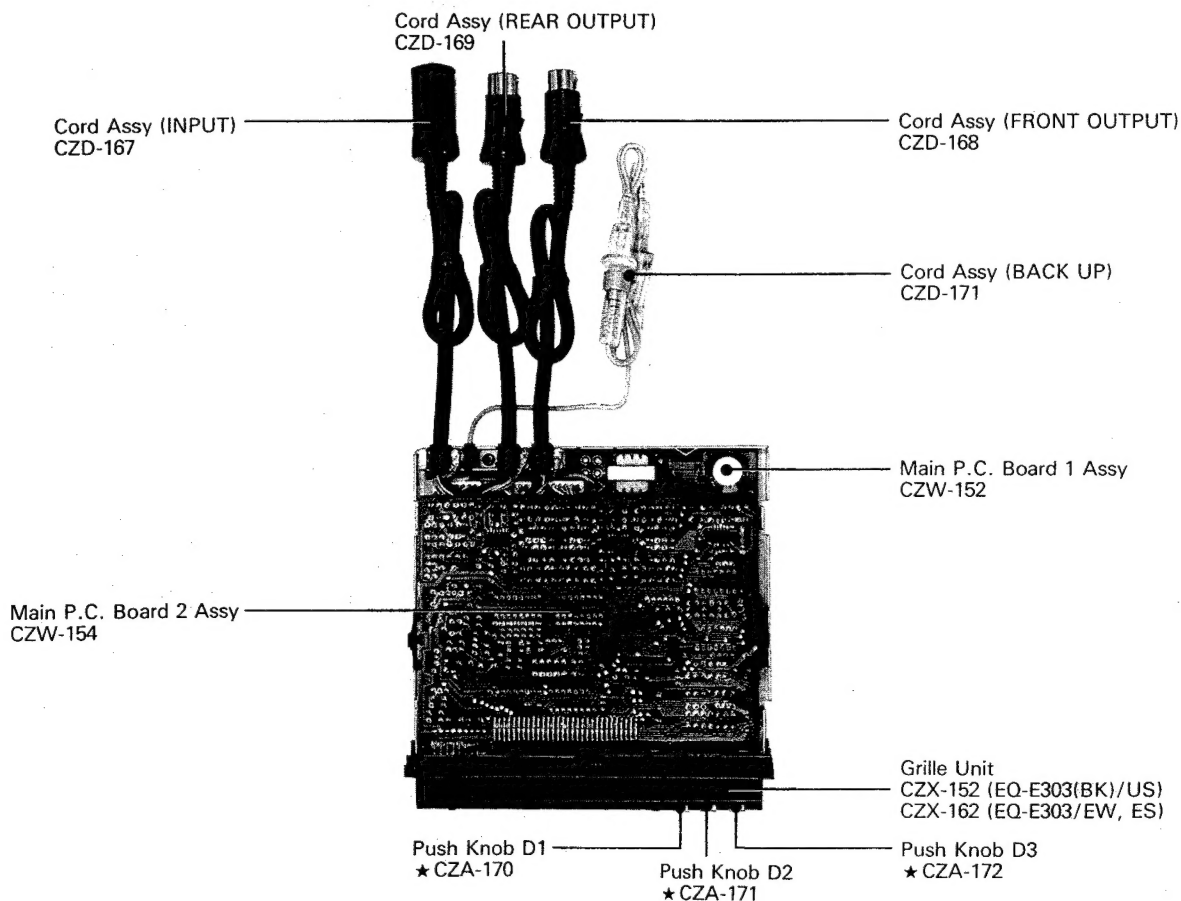


Fig. 3

3. CONNECTION

- Before making final connections, make temporary connections then operate the unit to check for any connecting cord problems.
- Refer to the main amp instruction manual for details on correct connection of speakers and power supply.
- Don't run the leads for the input cord of this unit and the main amp speaker leads close together. If you do, the deck or tuner will generate unwanted noise.
- If distance between the graphic equalizer and main amp is too far to make proper connections, please buy the optional exclusive extension cord for the Component Car Stereo.
- When using two main amps, use the accessory power supply connector and connect the cord to the over 10A accessory connector. (Be sure that both amps are connected respectively to the ground.)

2-speaker system

- Don't use the front speaker's cord for a 2-speaker system.

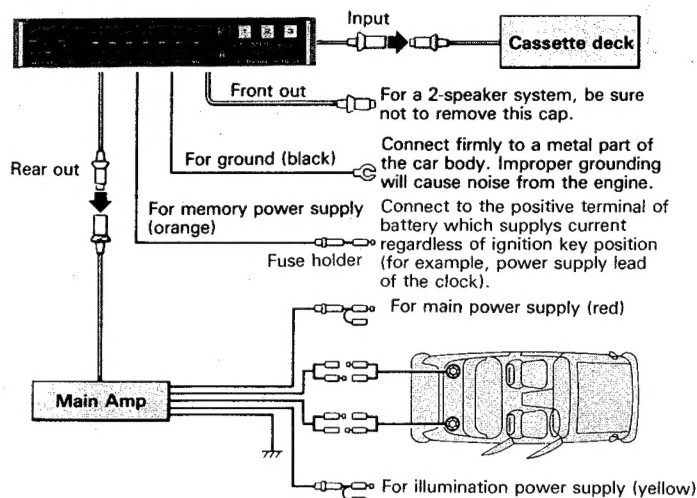


Fig. 4

4-speaker system

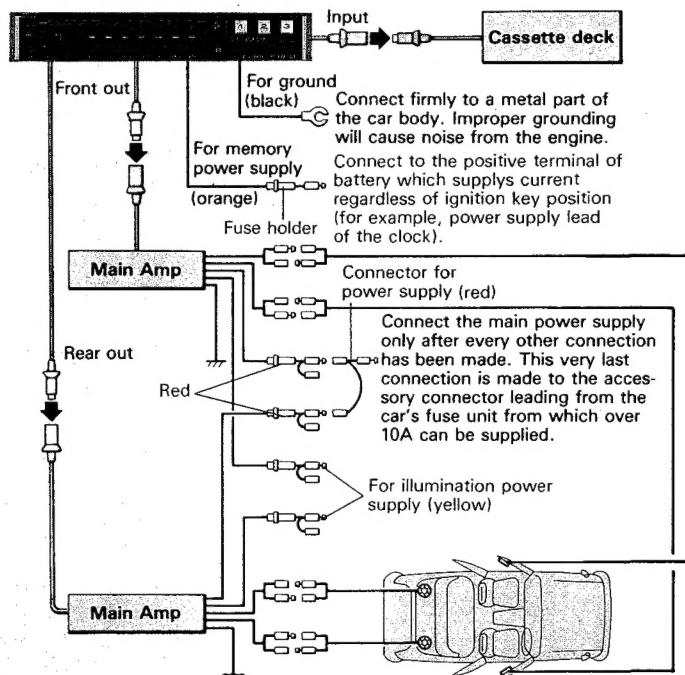


Fig. 5

4. DISASSEMBLY

• Removal of Upper Case

1. Remove the four screws labeled (A), then remove the upper case.

• Removal of Main P.C. Board 2 Assembly and Front Cabinet Assembly

1. Press the P.C. Board holder claws in the direction indicated by the arrow and lift the P.C. Board up from the main unit.
2. Remove the two screws labeled (B), then remove the front cabinet assembly.

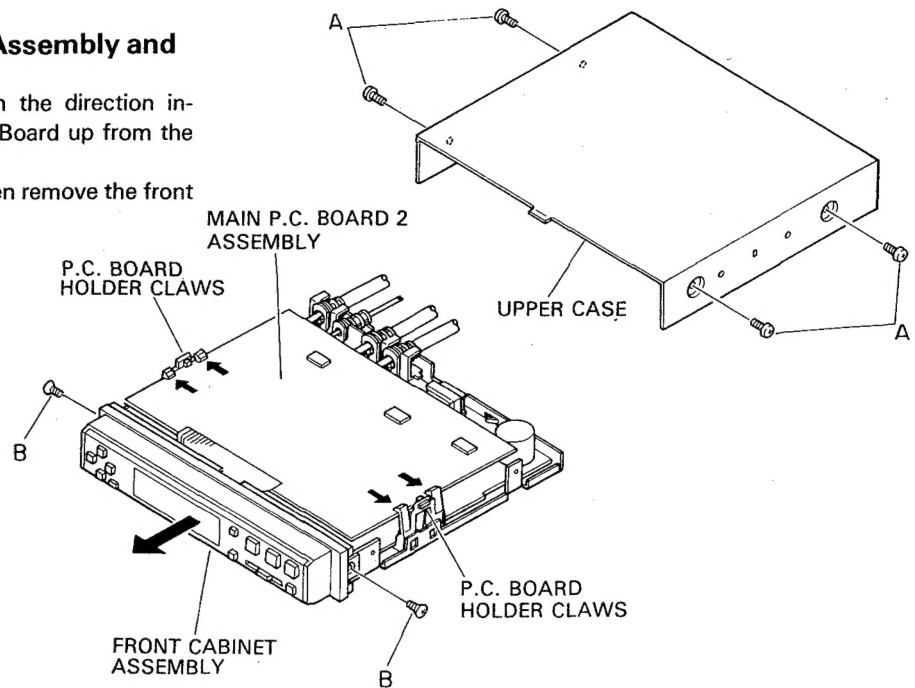


Fig. 6

• Removal of LED P.C. Board Assembly

1. Remove the three screws labeled (E) and (F), then pull out the P.C. Board. Make sure to unclip the four claws holding the P.C. Board in position.
2. When reinstalling the P.C. Board, care must be given to the position of the collar notch.

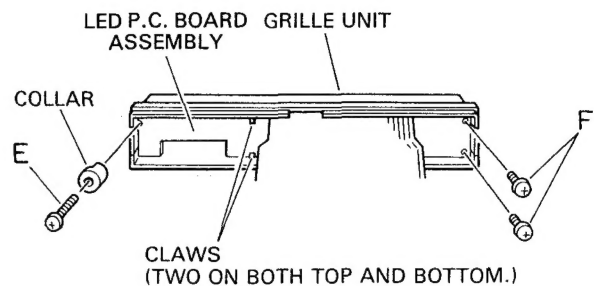


Fig. 7

• Removal of Volume P.C. Board and Main P.C. Board 1 Assembly

1. Remove the two screws labeled (C), then remove the volume P.C. Board.
2. Remove the screw labeled (D), press the P.C. Board holder claws in the direction indicated by the arrows, lift up the front part of the main P.C. Board 1 assembly and pull the P.C. Board 1 assembly toward you.

*Note:

When reinstalling the main P.C. Board 1 assembly, make sure that you insert it beneath the boss of the lower case, as shown in the illustration.

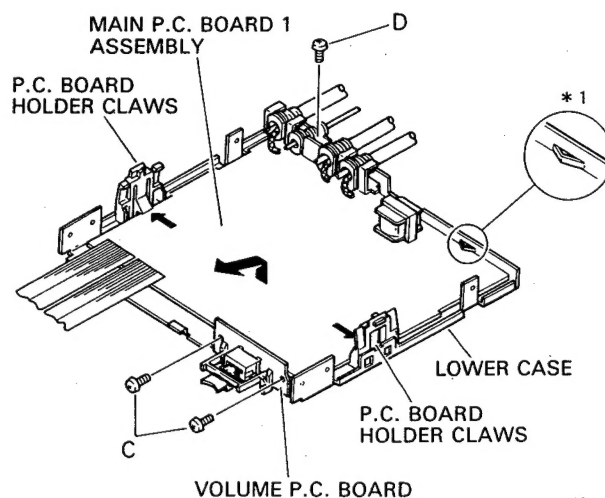


Fig. 8

5. ADJUSTMENT

5.1 Adjusting the Spectrum Analyzer Display LED

• Connection Diagram

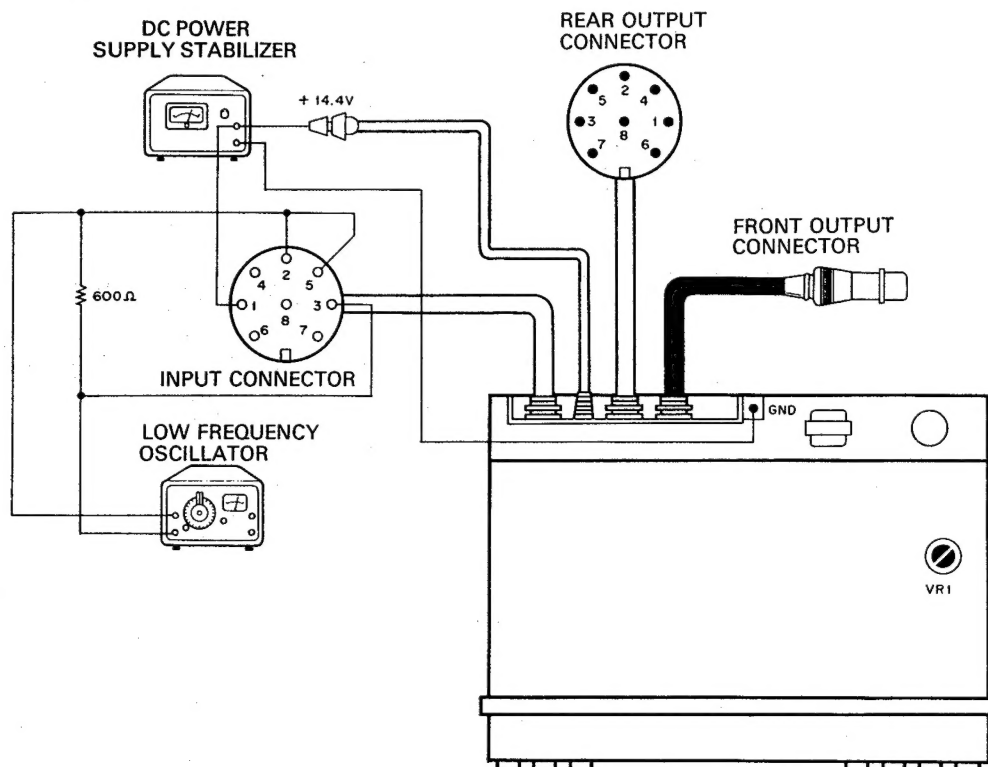


Fig. 9

• To Adjust

1. Set the fader (volume) control to the middle position and set the F and R switches to OFF.
2. Apply a 1kHz, -46 dBV (5.0mV) signal from the low frequency oscillator to the equalizer.
3. Adjust VR1 so that the LED on top of the spectrum analyzer display is lighted.

6. CIRCUIT DESCRIPTION

• Block Diagram

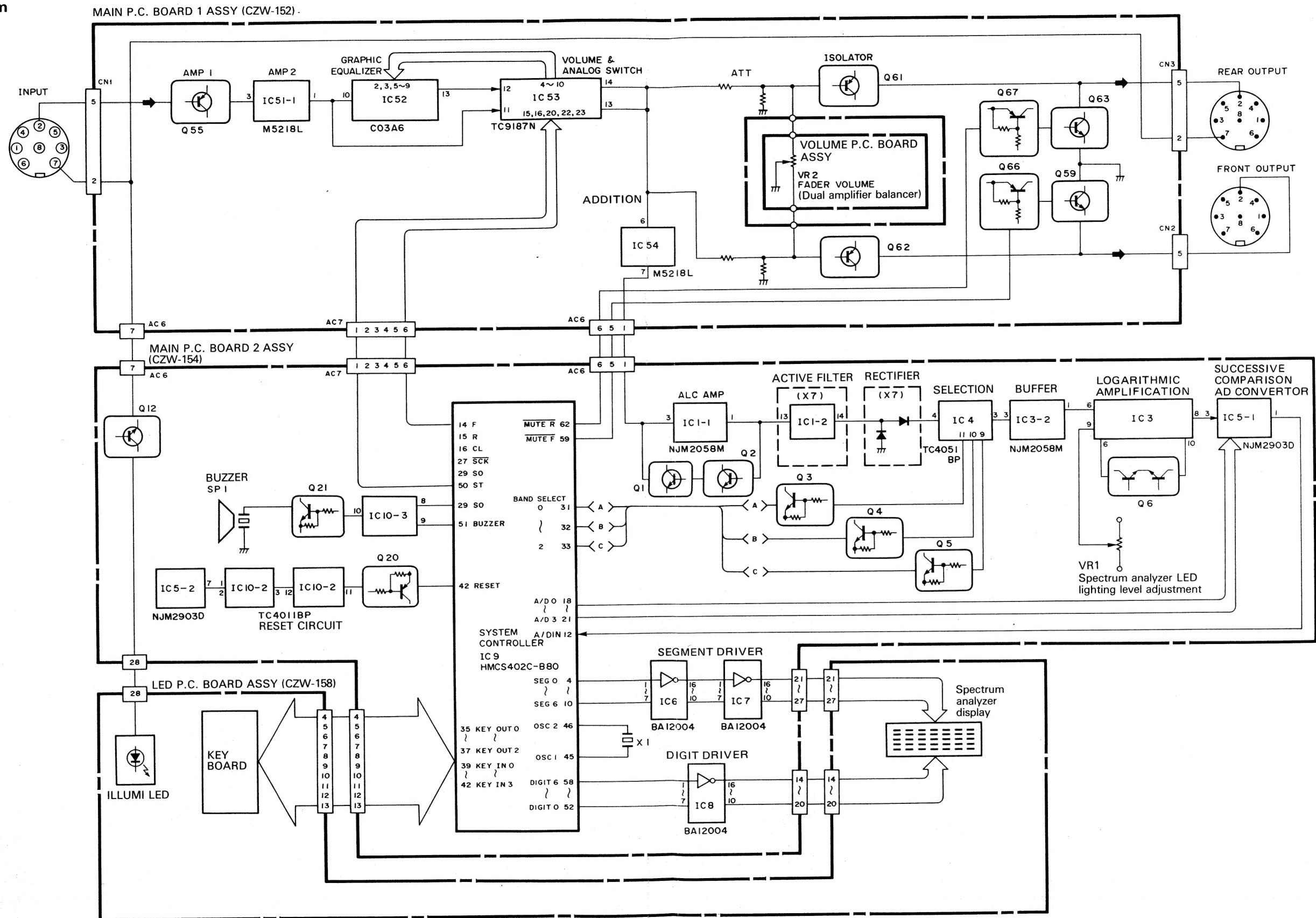


Fig. 10

• Signal Flow (Current) and Operation of Graphic Equalizer

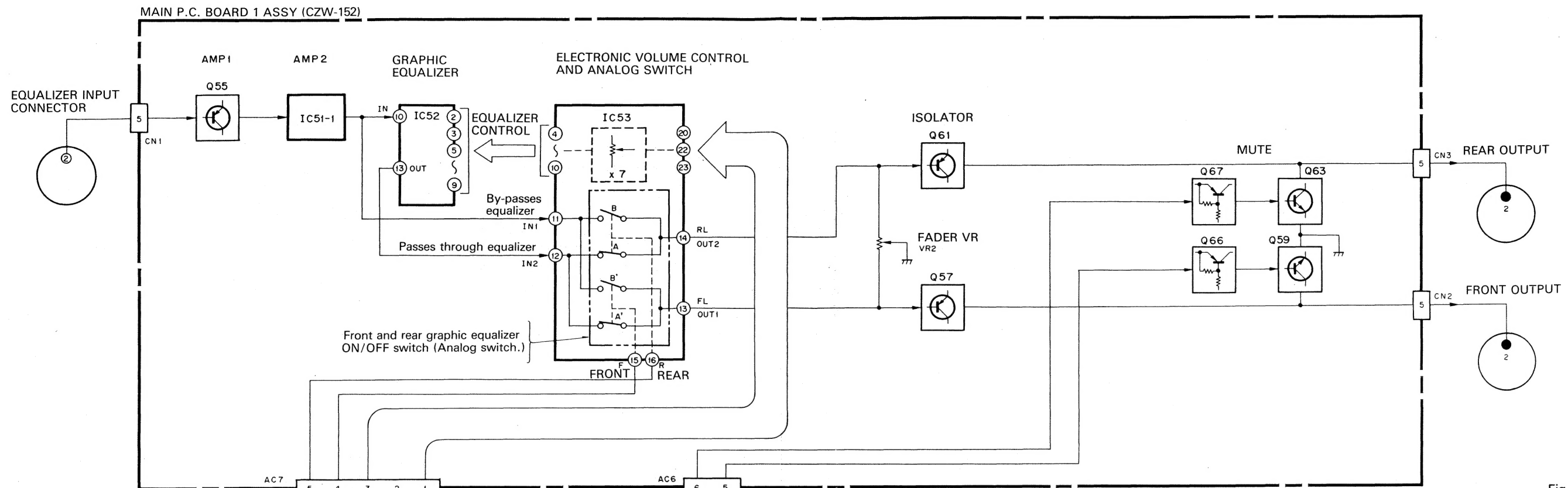


Fig. 11

• Level Diagram

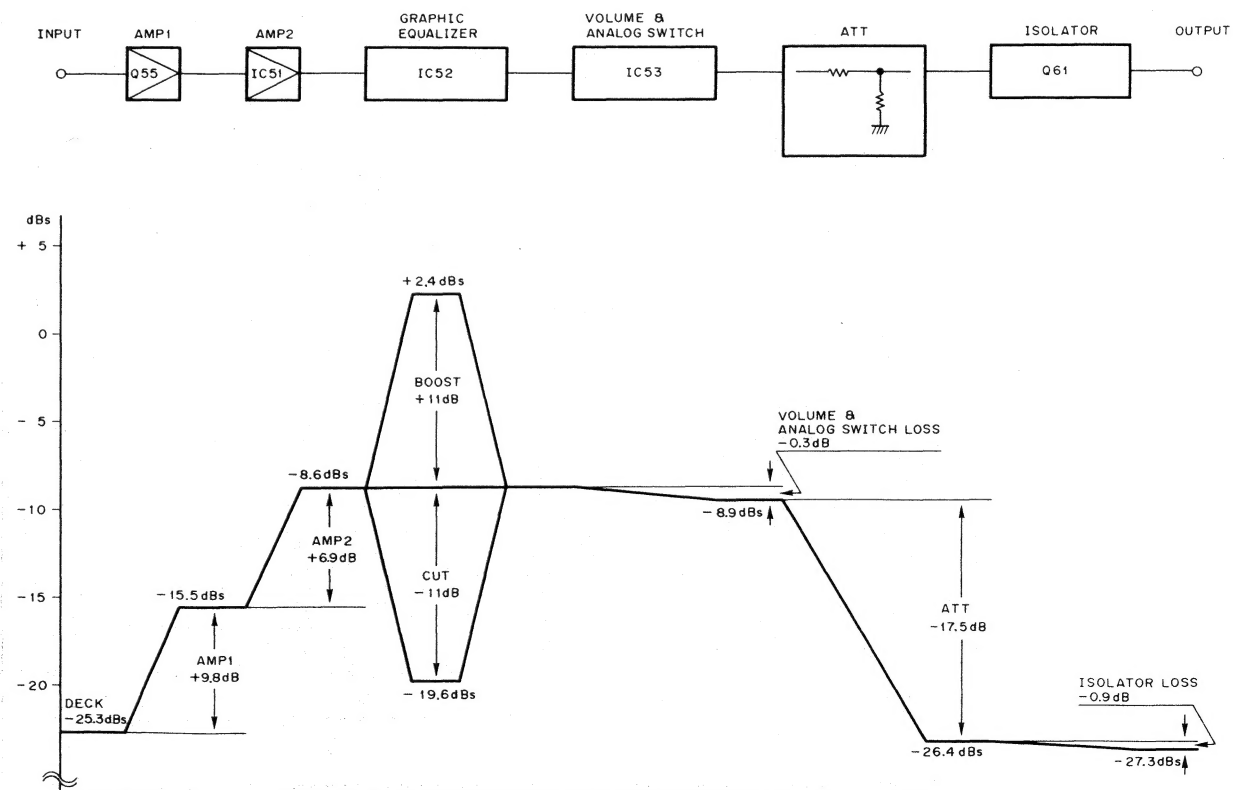
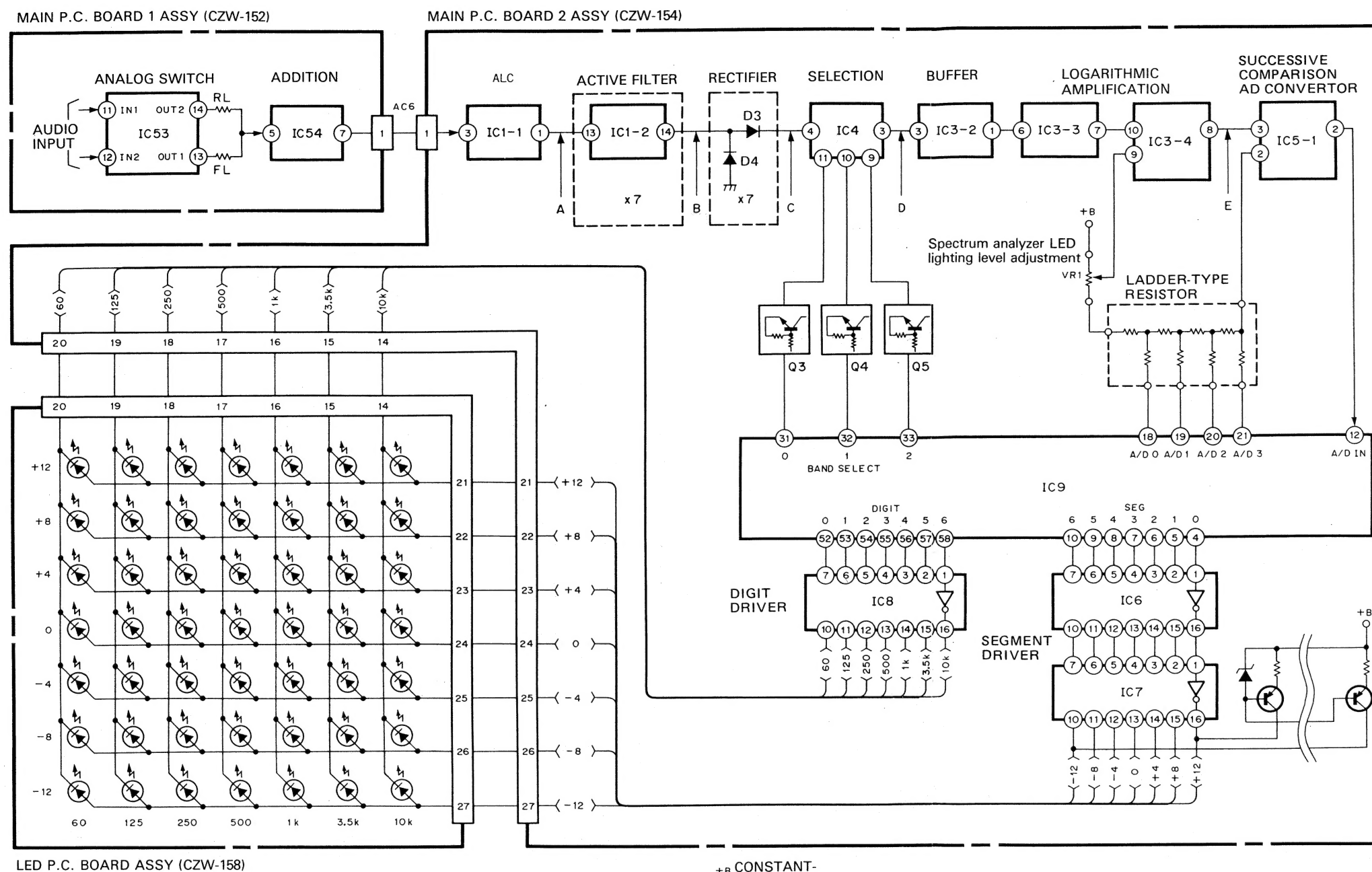


Fig. 12

• Operation of the Spectrum Analyzer



The front and rear left and right signals from IC53 are added by IC54, and the ALC circuit (IC1-1) holds the output constant. The signal is divided into seven frequency bands (60Hz, 125Hz, 250Hz, 500Hz, 1kHz, 3.5kHz, 10kHz.) by active filters (IC1-2, 3, 4 and IC2-1, 2, 3, 4). The signal is then rectified by diodes D3-D16 and fetched as a direct current component. The direct current component of each frequency point is selected one by one by the selection circuit (IC4), and made into a step waveform proportional to its direct current component.

Then the signal passes through a buffer (IC3-2) and enters the logarithmic amplifier (IC3-3, 4). Because the data from the spectrum analyzer is displayed in dB, logarithmic compression must be carried out. The voltage applied to pin 2 of the AD converter (IC5-1) is compared with the voltage input to pin 3. Then a 4-bit (16 step) digital signal is generated at pins 18-21 of IC9 to equalize the voltage of both pins (pin 2 and pin 3). The converted digital signal is processed by IC9 and lights the LED.

The VR1 connected to pin 9 of the logarithmic amplifier (IC3-4) changes the direct current level, which adjusts the lighting level of the spectrum analyzer.

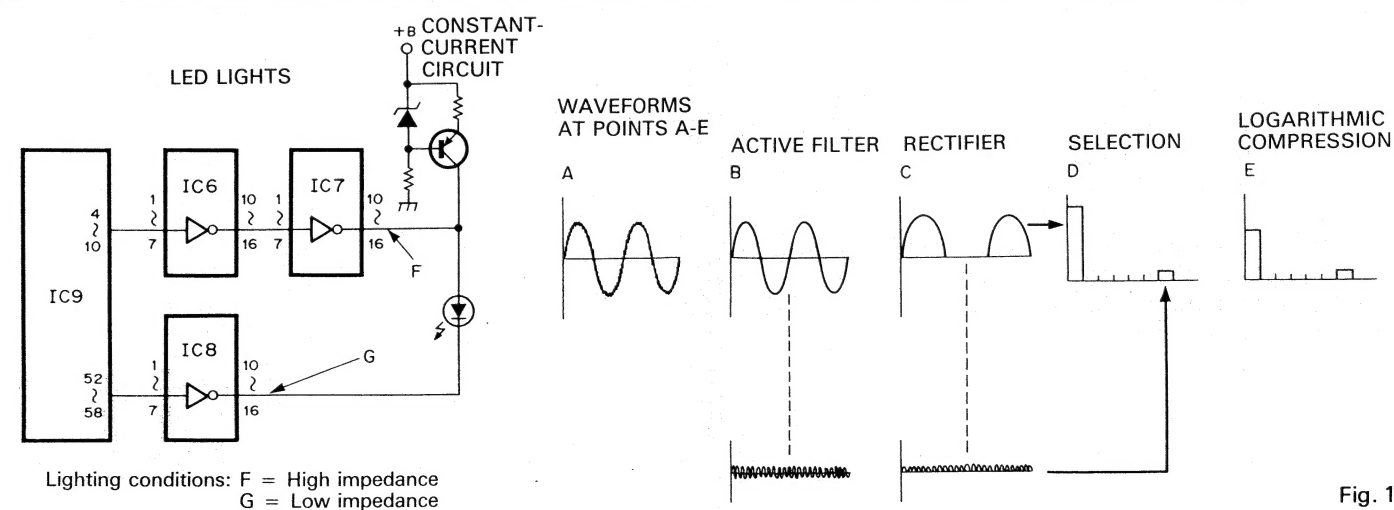


Fig. 13

• Block Diagram of Power Supply

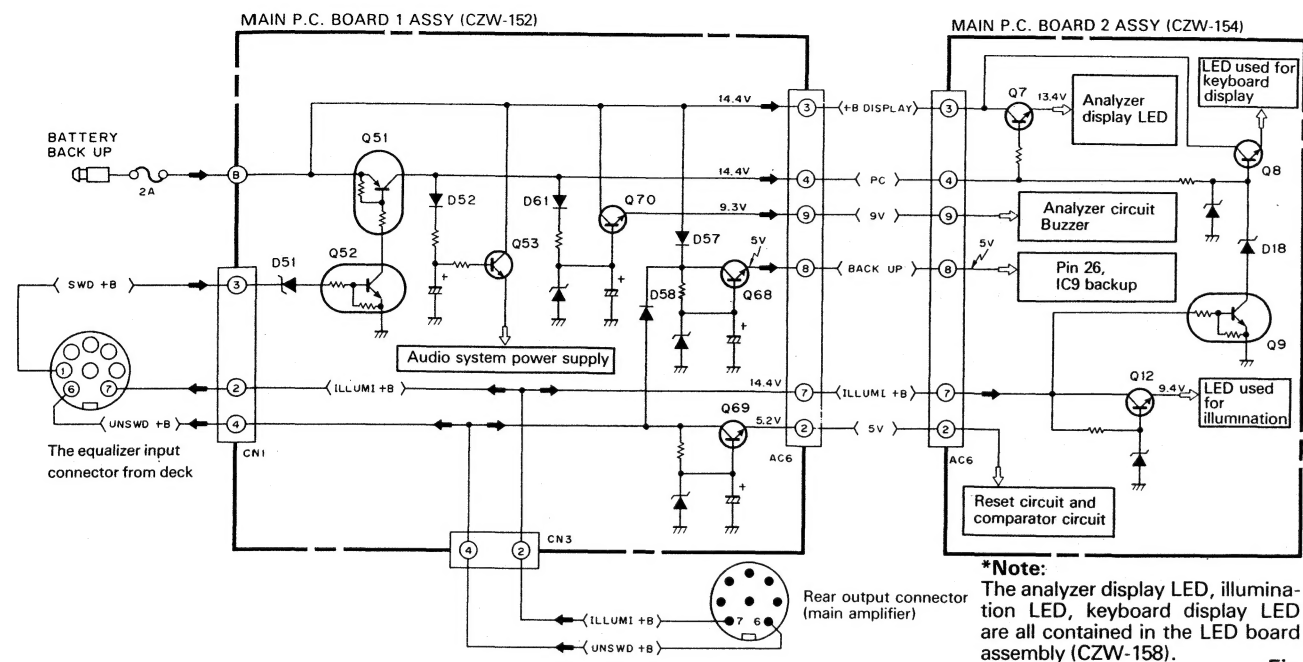


Fig. 14

When the power is off (i.e., the power is not supplied from unswitched +B of the main amplifier), only the backup power supply to Q68 is functioning—no other power is being supplied. Without the backup power supply, the unit will not function even when it is powered on.

When power is supplied to the unit, (i.e., power is supplied from the unswitched +B terminal of the main amplifier) and the switched +B voltage is applied to pin 1 of the equalizer input connector, both Q52 and Q51 turn on, generating a voltage to PC. This voltage activates Q7, Q8, Q53 and Q70, which

in turn supply voltage to each circuit. Q69 begins functioning when power is turned on.

Power is supplied to ILLUM +B through Q12. The ILLUM +B voltage is converted by Q9 from 5.3V to 3.8V and supplies power to the keyboard. This helps to dim the brightness of the keyboard display when the illuminator is on.

• Reset circuit

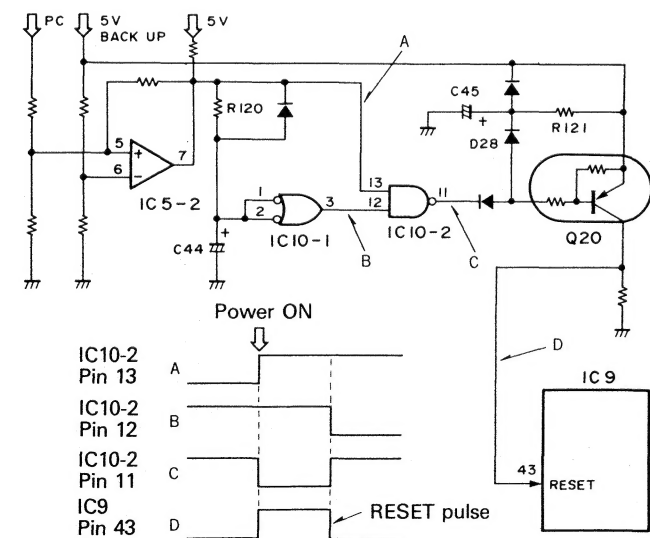


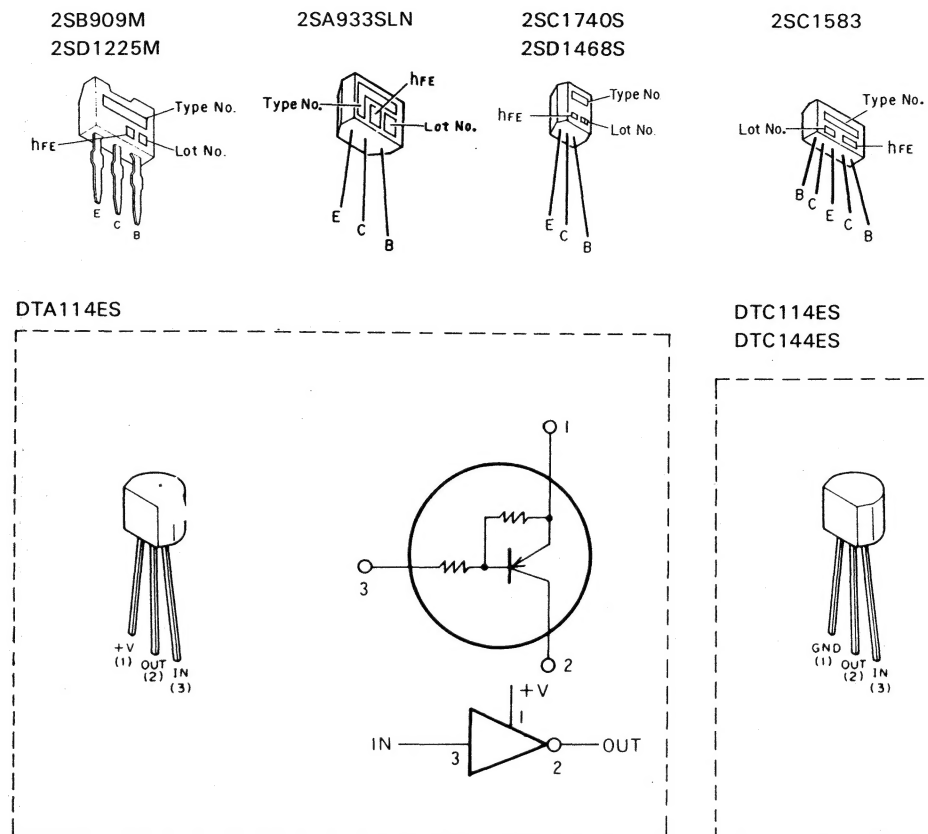
Fig. 15

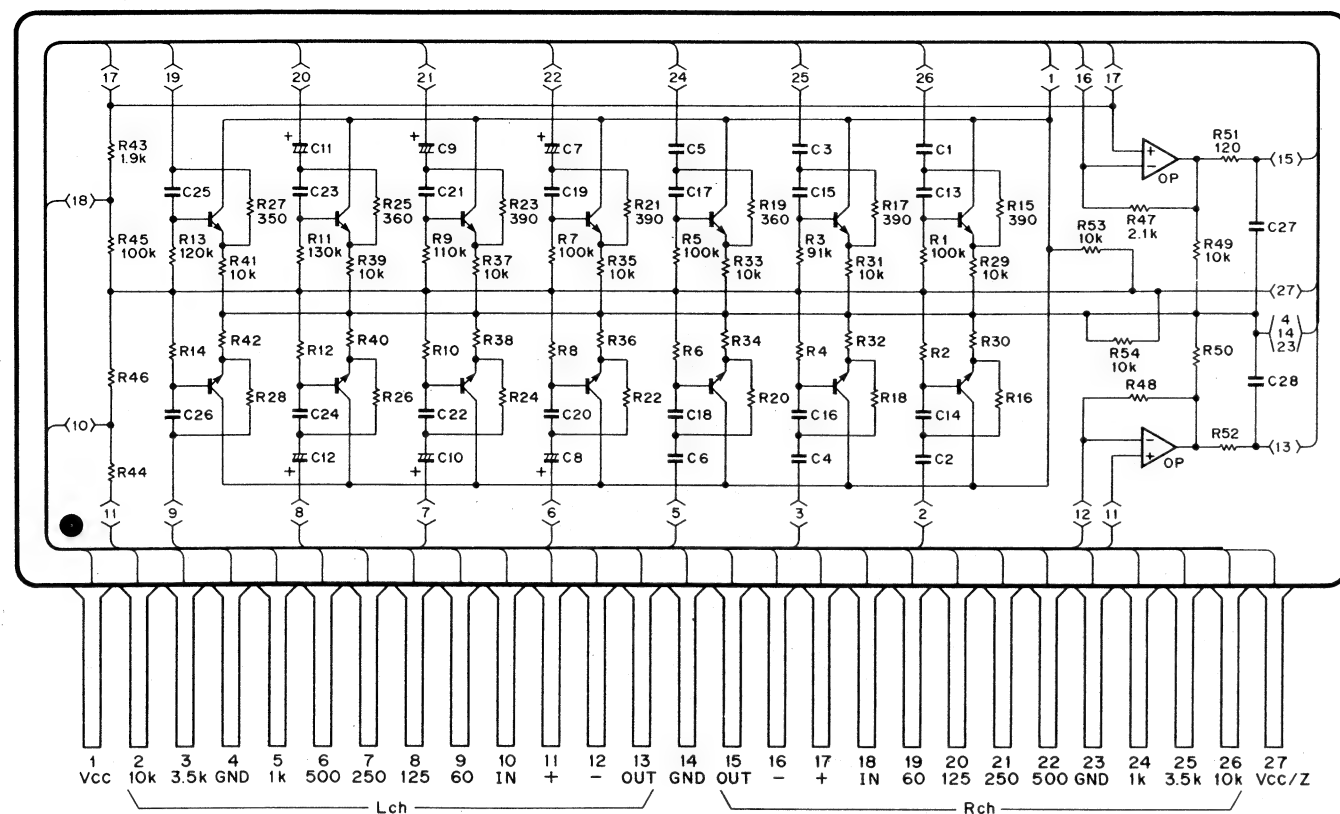
When power is off, the back up power supply is the only source of energy entering the unit. IC10-2 pin 11 (point C) goes HIGH, and Q20 is turned OFF. As a result, the RESET pin of IC9 (point D) goes LOW.

When the power is on, voltage is applied to the PC line, the electrical potential of pin 5 becomes greater than that of pin 6 (IC52-2), and pin 7 (IC5-2) goes from LOW to HIGH. As a result, pin 1 and 2 (IC10-1) goes from LOW to HIGH because C44 is charged through R120. Pin 3 then goes from HIGH to LOW, and IC10-2 responds as illustrated in the accompanying waveform. A single pulse is then supplied to IC9 pin 43 (RESET pin).

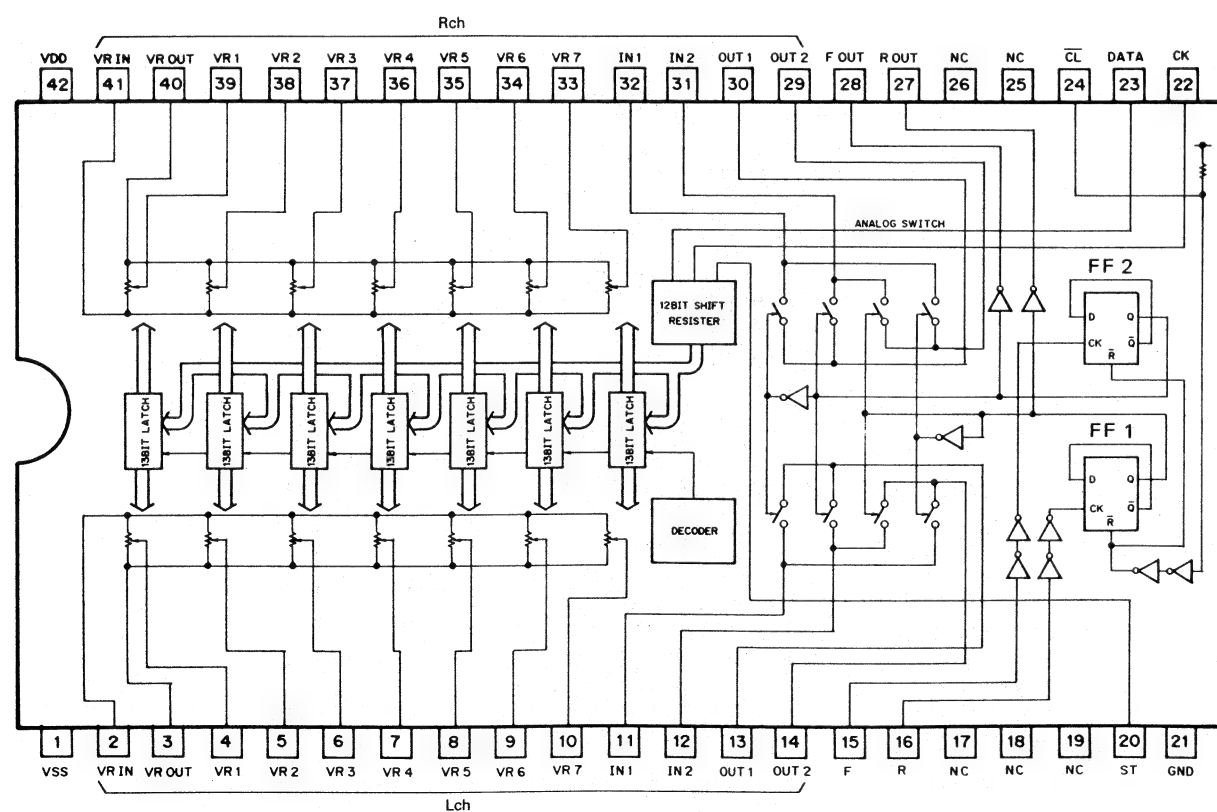
The STOP mode is cancelled by a RESET input. When the backup power supply is properly connected, the electrical potential of the cathode of D28 turns from LOW to HIGH by the time constant of R121 and C45, thus generating a RESET pulse.

• I C and transistors





TC9187N

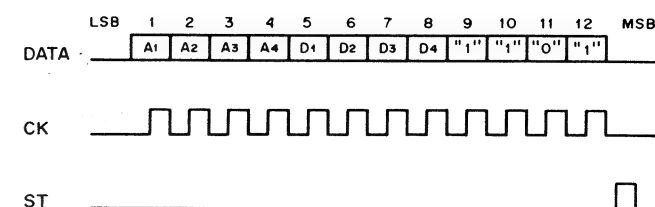


• Pin Functions: (TC9187N)

Pin	Pin Name	Function and Operation
2 41	(L) (R) VR _{IN}	Common input pin for each volume control
3 40	(L) (R) VR _{OUT}	Common output pin for each volume control
4 39	(L) (R) VR ₁	Common pin for volume control 1 60Hz
5 38	(L) (R) VR ₂	Common pin for volume control 2 125Hz
6 37	(L) (R) VR ₃	Common pin for volume control 3 250Hz
7 36	(L) (R) VR ₄	Common pin for volume control 4 500Hz
8 35	(L) (R) VR ₅	Common pin for volume control 5 1kHz
9 34	(L) (R) VR ₆	Common pin for volume control 6 3.5kHz
10 33	(L) (R) VR ₇	Common pin for volume control 7 10kHz
11 32	(L) (R) IN ₁	Input pin for the analog switch matrix (Input pin for signals that by-pass the EQ circuit.)
12 31	(L) (R) IN ₂	Input pin for the analog switch matrix (Input pin for signals that pass through the EQ circuit.)
13 30	(L) (R) OUT ₁	Front left output pin Front right output pin
14 29	(L) (R) OUT ₂	Rear left output pin Rear right output pin
15	F	Input pin for analog switch control (Turns the front equalizer circuit on and off)
16	R	Input pin for analog switch control (Turns the rear equalizer circuit on and off)
17~19 25~28		Not in use
20	ST	Strobe input pin. Control data at the CK pin and DATA pin is latched when this pin goes HIGH.
22	CK	Clock input pin. Fetches control data
23	DATA	Control data input pin. Control data is made up of 12 bits.
24	$\overline{\text{CL}}$	Clear input pin for the analog switch matrix. Turns the equalizer circuit off at a LOW level input.
1 21 42	V _{DD} GND V _{SS}	Power supply pin

*Pins 15 and 16 are active HIGH. The states of FF1 and FF2 are reversed at the leading edge of these pins and turns the circuit on and off.

• Control Data Format



a) A1-A4 (bits 1-4)

Data bits 1-4 select one of the seven volume control circuits denoted VR1-VR7.

A1	A2	A3	A4	Volume
H	L	L	H	VR ₁
L	H	L	H	VR ₂
H	H	L	H	VR ₃
L	L	H	H	VR ₄
H	L	H	H	VR ₅
L	H	H	H	VR ₆
H	H	H	H	VR ₇

b) D1-D4 (bits 5-8)

Data bits 5-8 set each volume step. Data bits 5-8 control the volume selected by A1-A4 in 13 steps.

D1	D2	D3	D4	Step
L	H	H	L	+6 (+12 dB)
H	L	H	L	+5 (+10 dB)
L	L	H	L	+4 (+8 dB)
H	H	L	L	+3 (+6 dB)
L	H	L	L	+2 (+4 dB)
H	L	L	L	+1 (+2 dB)
L	L	L	L	0 (0 dB)
H	H	H	H	-1 (-2 dB)
L	H	H	H	-2 (-4 dB)
H	L	H	H	-3 (-6 dB)
L	L	H	H	-4 (-8 dB)
H	H	L	H	-5 (-10 dB)
L	H	L	H	-6 (-12 dB)

c) Codes Bits (bits 9-12)

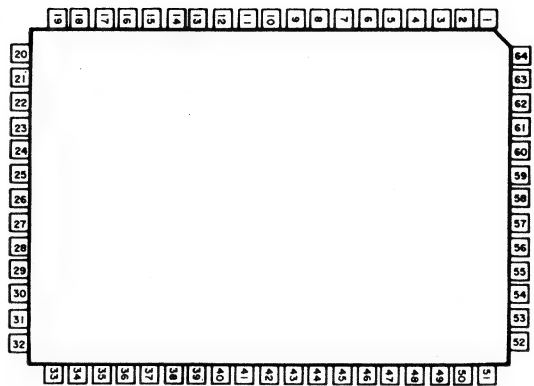
Data bits 9-12 must match the code for TC9187N. Data is received only when these bits are as shown below.

9	10	11	12
H	H	L	H



IC's marked by *are MOS type.
Be careful in handling them because they are very
liable to be damaged by electrostatic induction.

*HMCS402C-B80



• Pin Function (HMCS402C-B80)

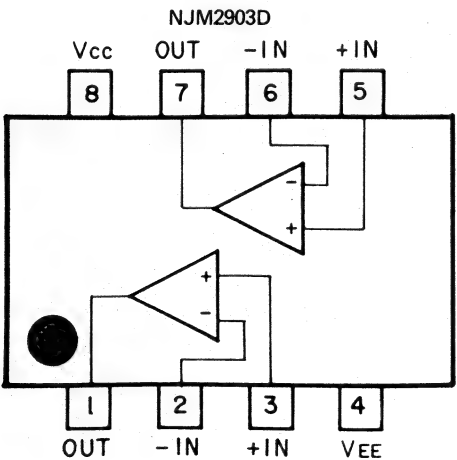
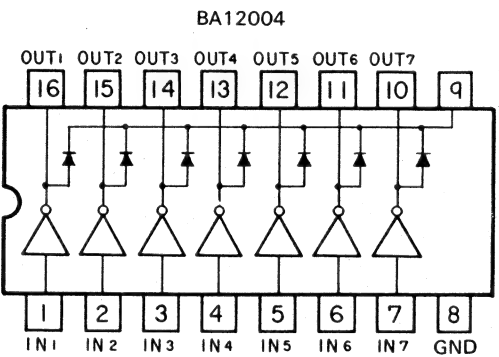
Pin	Pin name	I/O	Function and Operation
1~3			Unused
4	SEG 0	Output	Output for segment 0
2			
10	SEG 6		Output for segment 6
11			Unused
12	A/D IN	Input	For AD conversion Data input
13			Unused
14	F	Output	Output for front ON/OFF switch
15	R	Output	Output for rear ON/OFF switch
16	CL	Output	Turns both front and rear circuits OFF
17	POWER DOWN	Input	Detects power failure
18	A/D 0	Output	AD convertor output
21			
22	M1 LED	Output	LED for M1 key (Red)
23	M2 LED	Output	LED for M2 key (Red)
24	M3 LED	Output	LED for M3 key (Red)
25			Unused
26	Vcc		+5V
27	SCK	Output	Serial lock output
28			Unused
29	SO	Output	Serial out output
30			Unused

Pin	Pin name	I/O	Function and Operation
31	Band Select 0	Output	Analyzer input band selection output
2			
33	Band Select 2		
34			Unused
35	KEY OUT 0	Output	Output for key matrix
36	KEY OUT 1		
37	KEY OUT 2		
38			Unused
39	KEY IN 0	Input	Input for key matrix
2			
42	KEY IN 3		
43	RESET	Input	Input RESET. Reset with a HIGH level single pulse.
44	TEST		Unused. Fixed to HIGH level
45	OSC 1		Pins connected to ceramic oscillator
46	OSC 2		
47	GND		GND pin
48,49			Unused
50	ST	Output	Output for strobe to TC9187N (IC53)
51	BUZZER	Output	Generates key sound.
52	DIGIT 0	Output	Outputs for digit 0 of display.
2			
58	DIGIT 6		
59	MUTE F	Output	Mute output for front circuit
60	R LED	Output	LED for key R
61	F LED	Output	LED for key F
62	MUTE R	Output	Mute output for rear circuit
63,64			Unused

The TC4051BP is an 8 channel multiplexer capable of both selecting between the analog signal and digital signal and combining them. The switch corresponding to each of the 8 channels is turned on by the digital signal in the control pin.

Control input signals				"ON" channel
INH	C	B	A	
L	L	L	L	0
L	L	L	H	1
L	L	H	L	2
L	L	H	H	3
L	H	L	L	4
L	H	L	H	5
L	H	H	L	6
L	H	H	H	7

When a HIGH level is input to INH, no channel turns on regardless of the state of the other inputs.



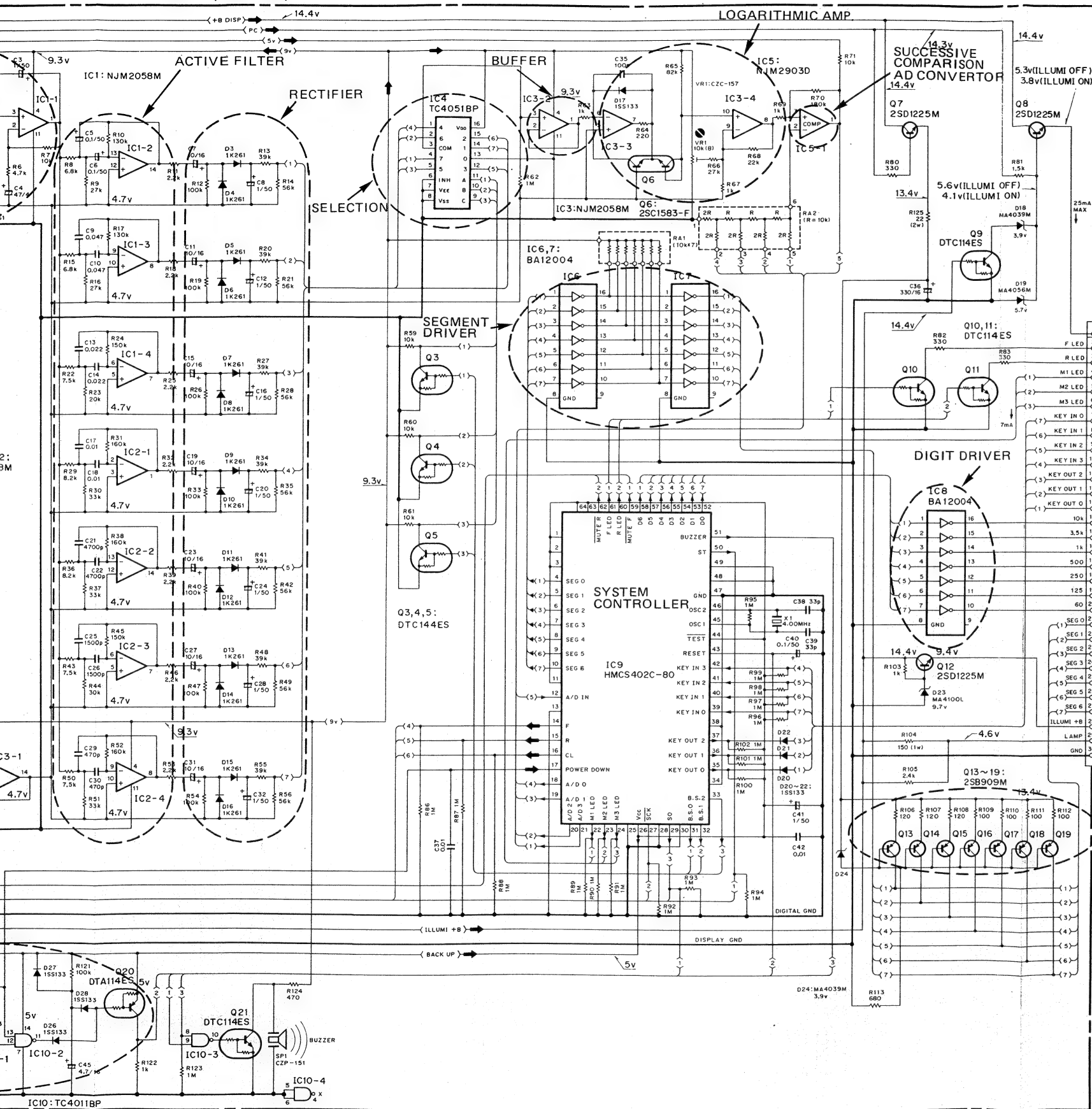
10 11 12 MSB
"1" "0" "1"

control circuits

s 5-8 control the

C9187N. Data is
below.

MAIN P.C.BOARD 2 ASSY (CZW-154)



LED P.C.BOARD ASSY (CZW-158)

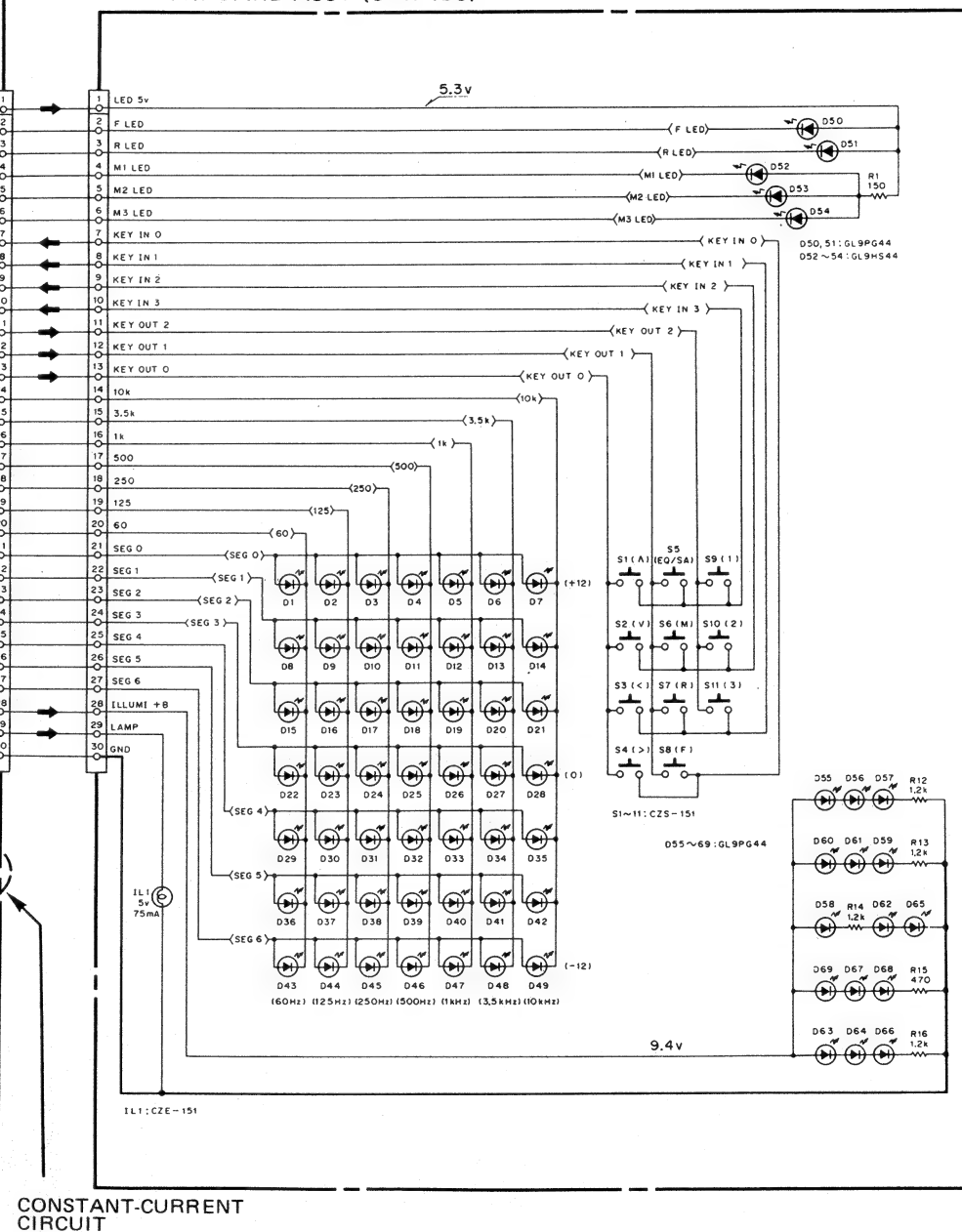
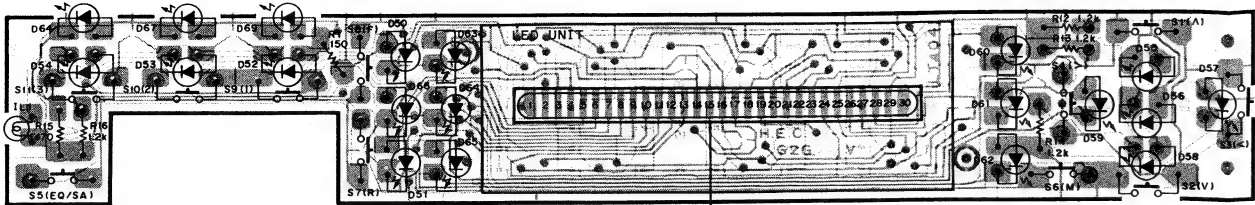


Fig. 16

8. CONNECTION DIAGRAM

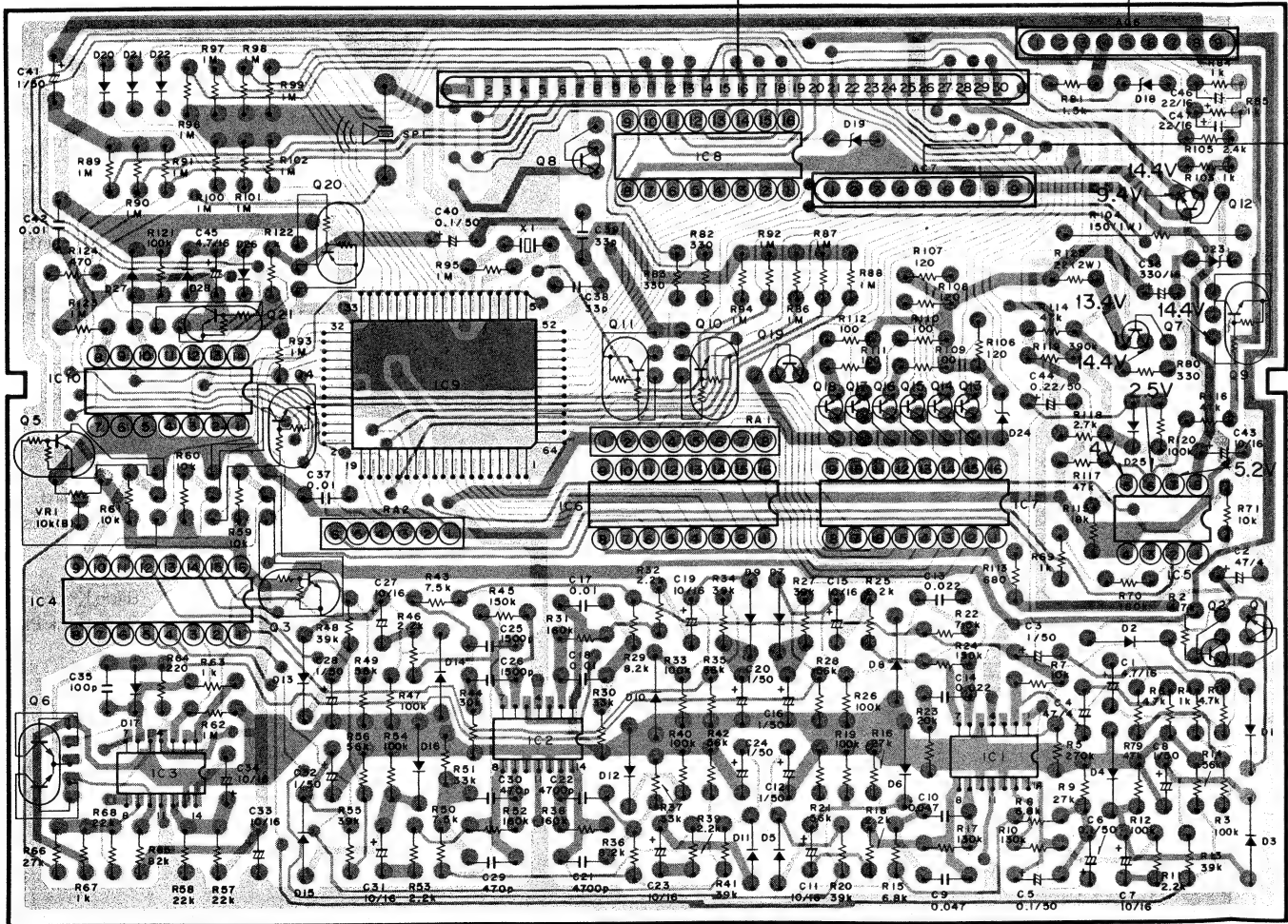
LED P.C.BOARD ASSY (CZW-158)



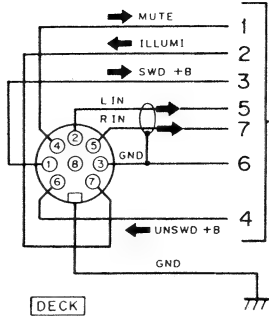
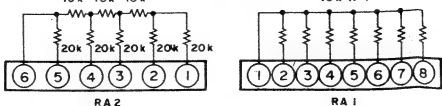
D50,51 : GL9PG44 D52~54:GL9HS44 D55~69:GL9PG44

MAIN P.C.BOARD 2 ASSY (CZW-154)

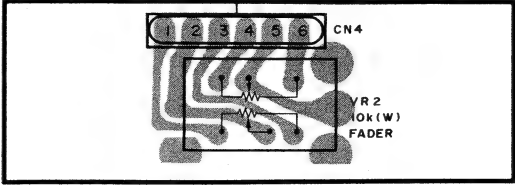
Q5	IC4	Q4				IC8				Q15				Q13		Q12 Q9								
IC, Q	Q6	IC3	IC10	Q21	Q3	Q20	IC9	IC2	Q8	Q11	Q10	IC6	Q19	Q18	Q17	Q16	IC7	Q14	IC1	Q7	IC5	Q2	Q1	
ADJ.	VR1																							



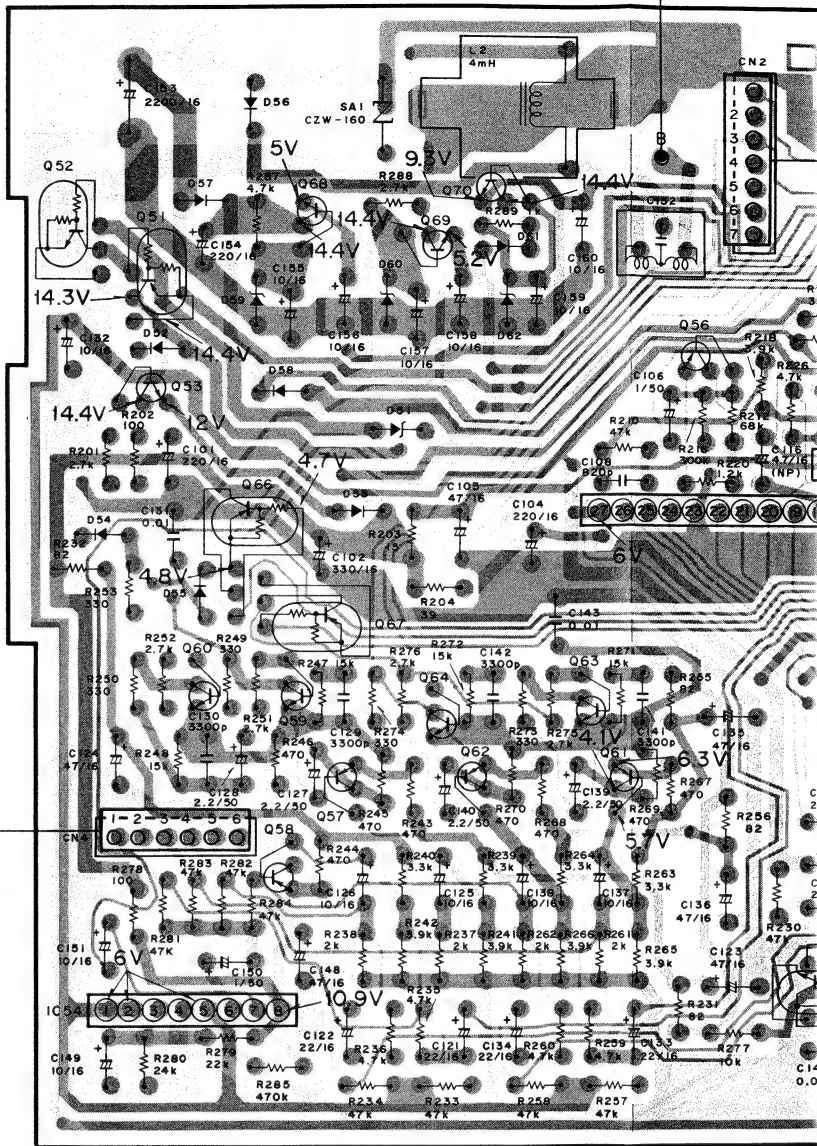
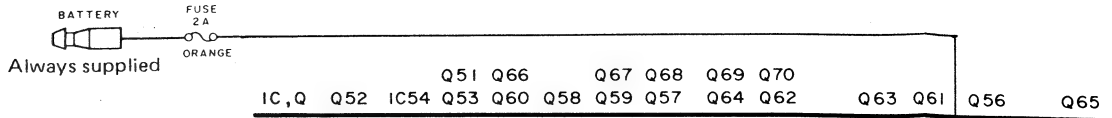
IC1~3 : NJM2058M	Q1,Q2 : 2SC1740S	D1~16 : 1K261
IC4 : TC4051BP	Q3~5,9 : DTC144ES	D17,20~22,25~28 : ISS133
IC5 : NJM2903D	Q6 : 2SC1583-F	D18 : MA4039M
IC6~8 : BA12004	Q7,8,12 : 2SD1225M	D19 : MA4056M
IC9 : HMC5402C-B80	Q10,11,21 : DTC114ES	D23 : MA4100L
IC10 : TC4011BP	Q13~19 : 2SB909M	D24 : MA4039M
	Q20 : DTA114ES	



Q8	B	5.6V (ILLUMI OFF)
		4.1V (ILLUMI ON)
	E	5.3V (ILLUMI OFF)
		3.8V (ILLUMI ON)
	C	14.4V



VOLUME P.C.BOARD ASSY



IC51,54 : M5218L	Q51,66,67 : DTA114ES	Q65 : DTC144ES	D51,59 :
IC52 : C03A6	Q52 : DTC114ES	Q68,69 : 2SC1740S	D52~55 :
IC53 : TC9187N	Q53,70 : 2SD1225M		D56 : SR
	Q55~58,61,62 : 2SA933S		D62 : MA
	Q59,60,63,64 : 2SD1468S		

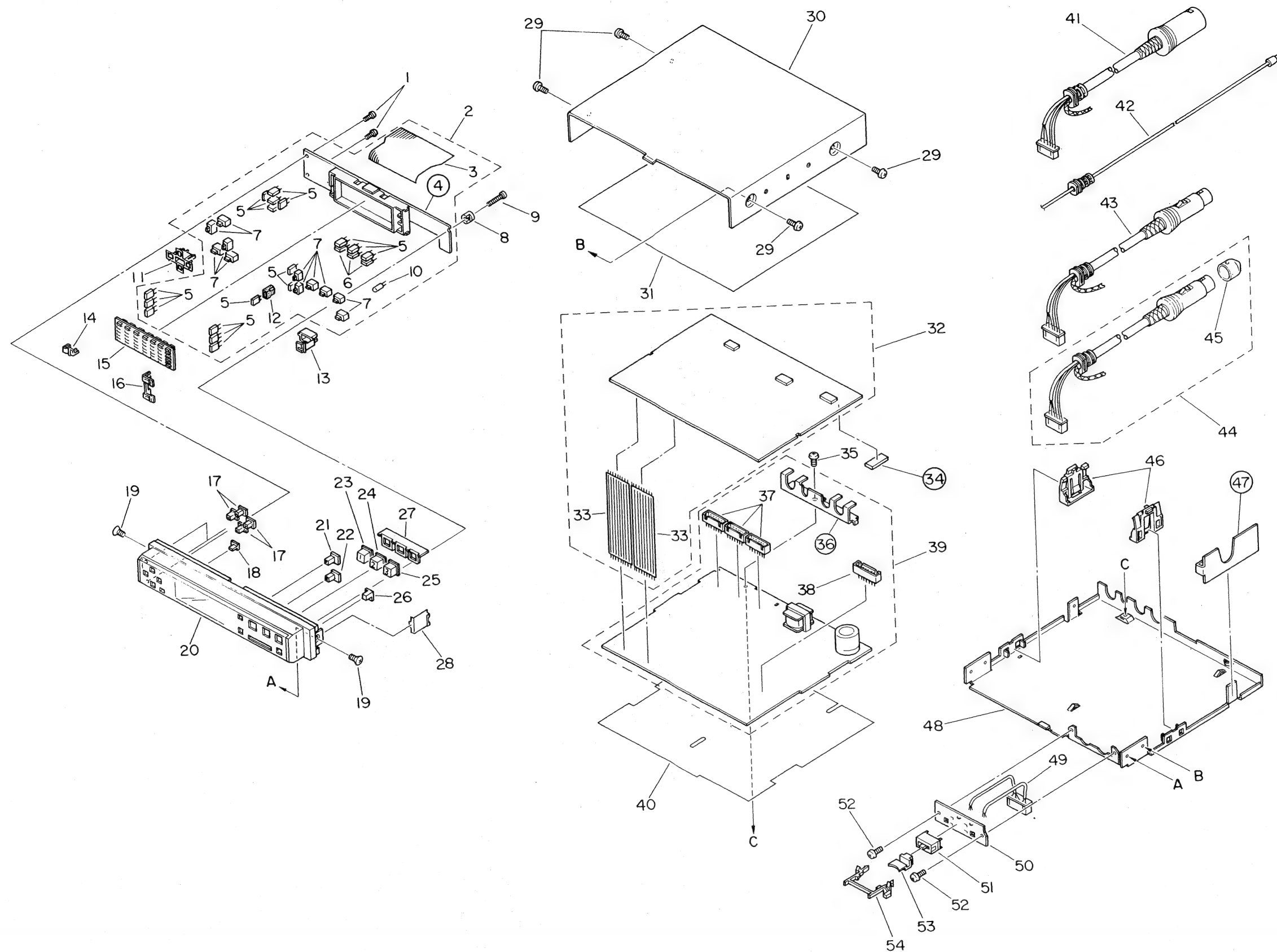
MAIN P.C.BOARD 2 ASSY (CZW-154)

	1	2	3	4	5	6	7	8	9
IC1				9.3	4.7				
IC2			4.7	9.3	4.7				
IC3				9.3	4.7				



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9. EXPLODED VIEW



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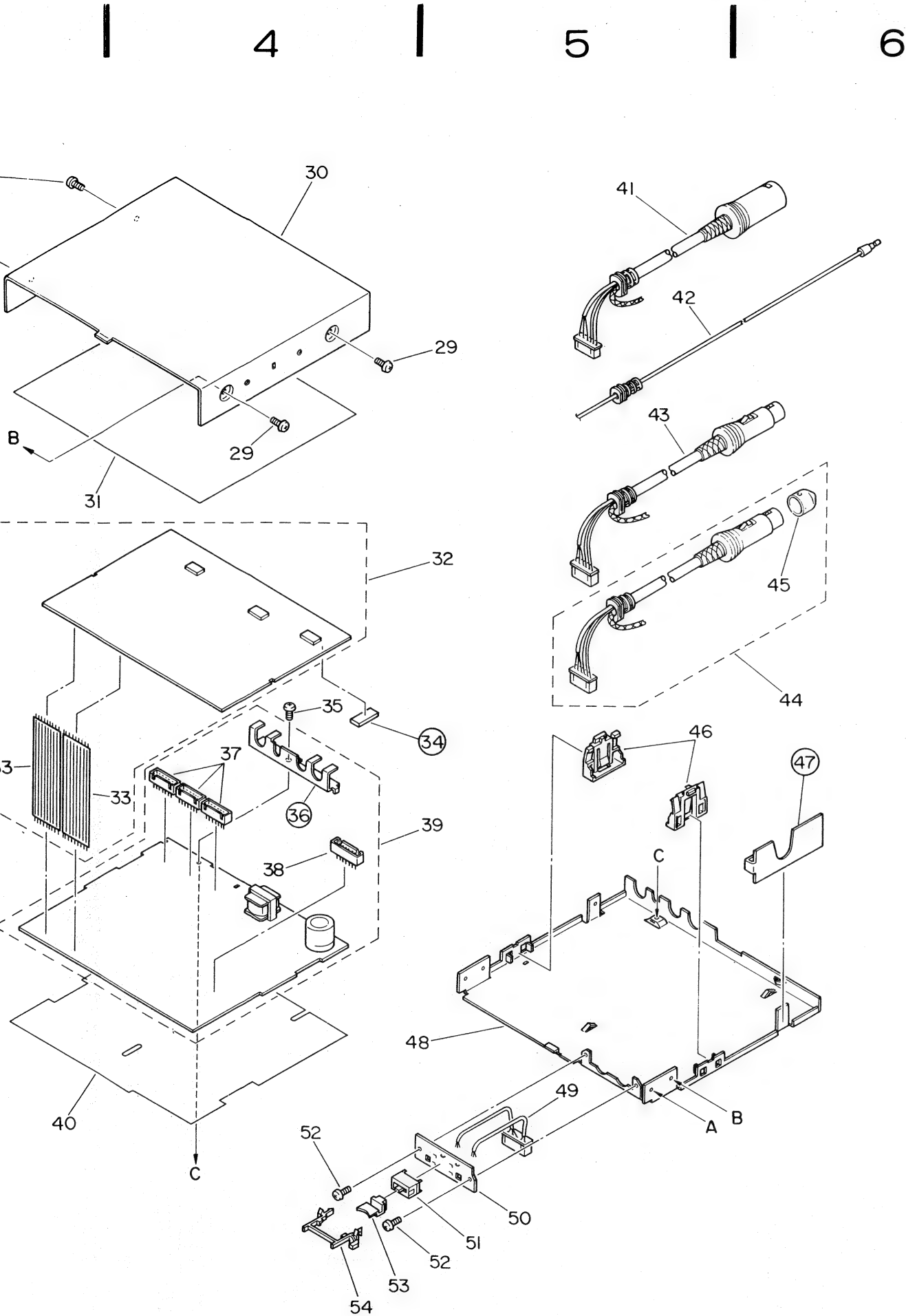
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Fig. 18



• Parts List

NOTE:

- For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.
- ★ ★: GENERALLY MOVES FASTER THAN ★.
- This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- Parts whose parts numbers are omitted are subject to being not supplied.

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	PPZ20P060FZN	Screw			CBA-121	Screw (EQ-E303/EW, ES)
	2.	CZW-158	LED P.C. Board Assy		30.	CZN-218	Upper Case (EQ-E303(BK)/US)
	3.	CZN-152	P.C. Board			CZN-216	Upper Case (EQ-E303/EW, ES)
	4.		LED Unit		31.	CZN-159	Insulator
★	5.	GL9PG44	LED		32.	CZW-154	Main P.C. Board 2 Assy
★	6.	GL9HS44	LED		33.	CZK-153	P.C. Joiner
★ ★	7.	CZS-151	Switch		34.		Sheet
	8.	CZN-163	Collar		35.	BMZ26P050FZN	Screw
	9.	PPZ20P100FZN	Screw		36.		Bracket
★ ★	10.	CZE-151	Lamp, 75mA 5V		37.	CZK-152	Connector
	11.	CZN-172	Knob Holder A		38.	CZK-151	Connector
	12.	CZN-166	Spacer		39.	CZW-152	Main P.C. Board 1 Assy
	13.	CZN-175	Knob Holder E		40.	CZN-161	Insulator
	14.	CZN-173	Knob Holder B		41.	CZD-167	Cord Assy (INPUT)
	15.	CZX-161	Lens Unit		42.	CZD-171	Cord Assy (BACK UP)
	16.	CZN-174	Knob Holder C		43.	CZD-169	Cord Assy (REAR OUTPUT)
★	17.	CZA-166	Push Knob A		44.	CZD-168	Cord Assy (FRONT OUTPUT)
★	18.	CZA-167	Push Knob B		45.	CZN-178	Cap
	19.	CMZ26P040FZN	Screw		46.	CZN-170	PCB Holder
	20.	CZX-152	Grille Unit (EQ-E303(BK)/US)		47.		Heat Sink
		CZX-162	Grille Unit (EQ-E303/EW, ES)		48.	CZN-160	Lower Case
★	21.	CZA-168	Push Knob CF		49.	CZD-151	Connector
★	22.	CZA-169	Push Knob CR		50.	CZN-151	P.C. Board
★	23.	CZA-170	Push Knob D1	★ ★	51.	CZC-156	Slide Volume, 10kΩ(W)
★	24.	CZA-171	Push Knob D2		52.	BMZ26P050FZN	Screw
★	25.	CZA-172	Push Knob D3	★	53.	CZA-159	Slide Knob
★	26.	CZA-173	Push Knob E		54.	CZN-164	Slide Back Plate
	27.	CZN-176	Knob Holder D				
	28.	CZN-162	Heat Barrier				
	29.	CBA-178	Screw (EQ-E303(BK)/US)				

Fig. 18

10. ELECTRICAL PARTS LIST

NOTE:

When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	56×10^1	561	.....	RD1/4PS	5	6	1	J
47kΩ	47×10^3	473	.....	RD1/4PS	4	7	3	J
0.5Ω	0R5		.....	RN2H	0	R	5	K
1Ω	010		.....	RS1P	0	1	0	K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).
5.62kΩ 562×10^1 RN1/4SR 5 6 2 1 F

- For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.
- ★ ★: GENERALLY MOVES FASTER THAN ★.
- This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- Parts whose parts numbers are omitted are subject to being not supplied.

Main P.C. Board 1 Assy (CZW-152)

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★ ★	IC51, 54	M5218L
★ ★	IC52	C03A6
★ ★	IC53	TC9187N
★ ★	Q51, 66, 67	DTA114ES
★ ★	Q52	DTC114ES
★ ★	Q53, 70	2SD1225M
★ ★	Q55 — 58, 61, 62	2SA933SLN
★ ★	Q59, 60, 63, 64	2SD1468S
★ ★	Q65	DTC144ES
★ ★	Q68, 69	2SC1740S
★	D51, 59, 60	MA4056M
★	D52 — 55, 57, 58, 61	1SS133
★	D56	SR1K-4
★	D62	MA4110L
★	SA1 Surge Absorber	CZW-160
	L2 Choke Coil, 4mH	

RESISTORS

Mark	Symbol & Description	Part No.
	All Resistors	RD1/4PS□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C101, 104, 111, 112, 154	CEA221M16LS
	C102	CEA331M16L2
	C103, 123, 124, 135, 136, 148	CEA470M16LS
	C105, 106, 109, 110, 119, 120, 150	CEA010M50LS
	C107, 108	CKDYB821K50
	C113, 114, 117, 118	CZC-154
	22μF/16V(NP)	
	C115, 116 4.7μF/16V(NP)	CZC-155
	C121, 122, 133, 134	CEA220M16LS
	C125, 126, 137, 138, 149, 151, 155 — 160	CEA100M16LS
	C127, 128, 139, 140	CEA2R2M50LS
	C129, 130, 141, 142	CQMAH332J50
	C131, 143	CKDYF103Z50
	C144 — 147	CKDYD102M50
	C152	CZC-153
	C153 2200μF/16V	CZC-152
	C161, 162	CKDYB221K50

Main P.C. Board 2 Assy (CZW-154)**MISCELLANEOUS**

Mark	Symbol & Description	Part No.
★ ★	IC1 — 3	NJM2058M
★ ★	IC4	TC4051BP
★ ★	IC5	NJM2903D
★ ★	IC6 — 8	BA12004
★ ★	IC9	HMCS402C-B80
★ ★	IC10	TC4011BP
★ ★	Q1, 2	2SC1740S
★ ★	Q3 — 5, 9	DTC144ES
★ ★	Q6	2SC1583-F
★ ★	Q7, 8, 12	2SD1225M
★ ★	Q10, 11, 21	DTC114ES
★ ★	Q13 — 19	2SB909M
★ ★	Q20	DTA114ES
★	D1 — 16	1K261
★	D17, 20 — 22, 25 — 28	1SS133
★	D18, 24	MA4039M
★	D19	MA4056M
★	D23	MA4100L
	RA1 Resistor Array	CZW-163
	RA2 Resistor Array	CZW-164
★ ★	VR1 Semi-fixed, 10k Ω (B)	CZC-157
	X1 Ceramic Oscillator	CZS-152
	SP1 Buzzer	CZP-151

RESISTORS

Mark	Symbol & Description	Part No.
	R104	RN1P□□□J
	R125	RT2B□□□K
	Other Resistors	RD1/4PS□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, 45	CEA4R7M16LS
	C2, 4	CEA470M4LS
	C3, 8, 12, 16, 20, 24, 28, 34, 41	CEA010M50LS
	C5, 6, 40	CEA0R1M50LS
	C7, 11, 15, 19, 23, 27, 31, 33, 34, 43	CEA100M16LS
	C9, 10	CQFAH473J50L
	C13, 14	CQFAH223J50L
	C17, 18	CQMAH103J50
	C21, 22	CQMAH472J50
	C25, 26	CQMAH152J50
	C29, 30	CCDYB471K50
	C35	CCDSL101K50
	C36	CEA331M16L2
	C37, 42	CKDYF103Z50
	C38, 39	CCDSL330K50
	C44	CEAR22M50LS
	C46, 47	CEA220M16LS

LED P.C. Board Assy (CZW-158)

Mark	Symbol & Description	Part No.
★	D50, 51, 55 — 69 LED	GL9PG44
★	D52 — 54 LED	GL9HS44
★ ★	IL1 Lamp, 75mA 5V	CZE-151
★ ★	S1 — 11 Switch	CZS-151

Volume P.C. Board Assy

Mark	Symbol & Description	Part No.
★ ★	VR2 Slide Volume, 10k Ω (W)	CZC-156

11. PACKING METHOD

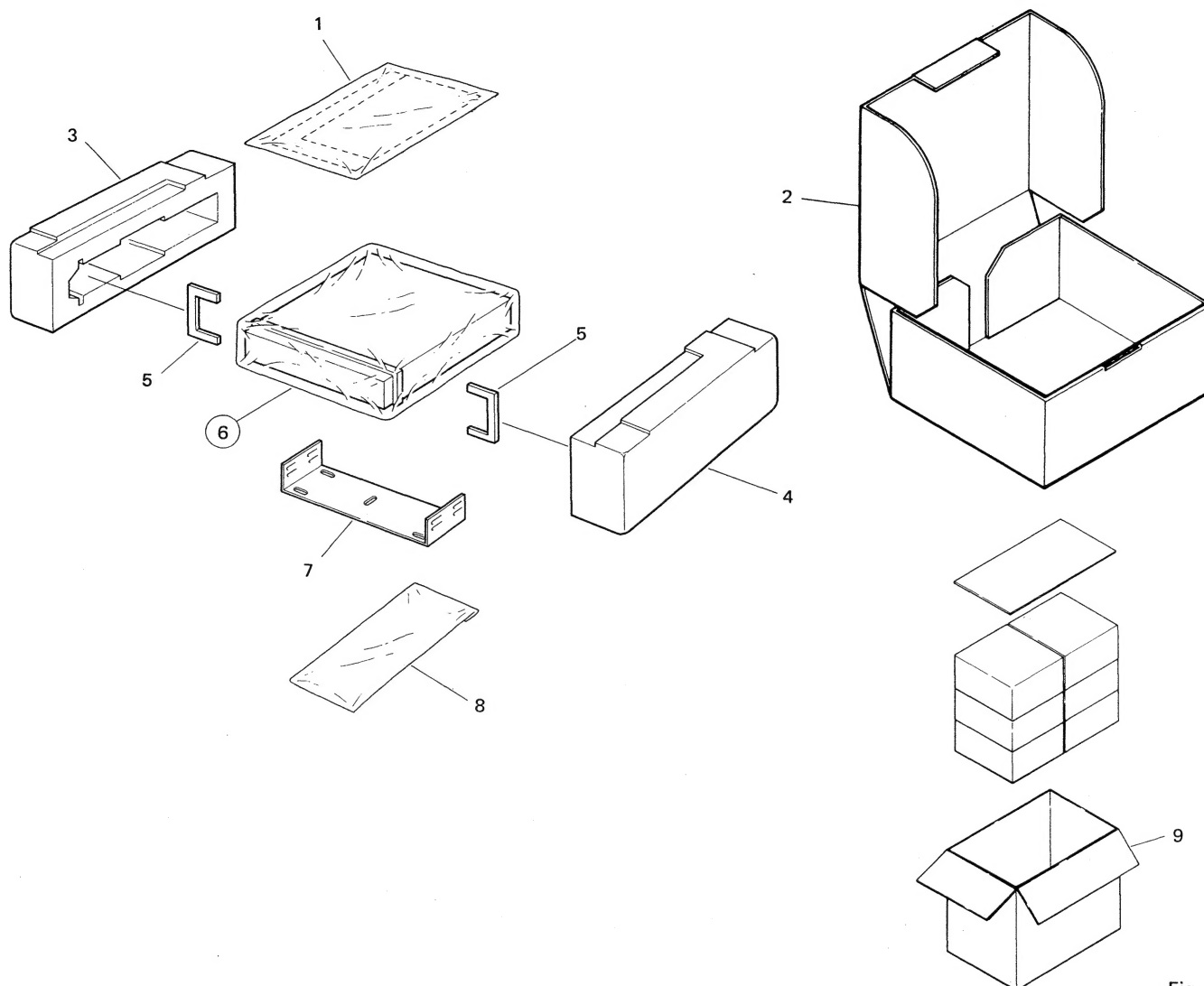


Fig. 19

• Parts List

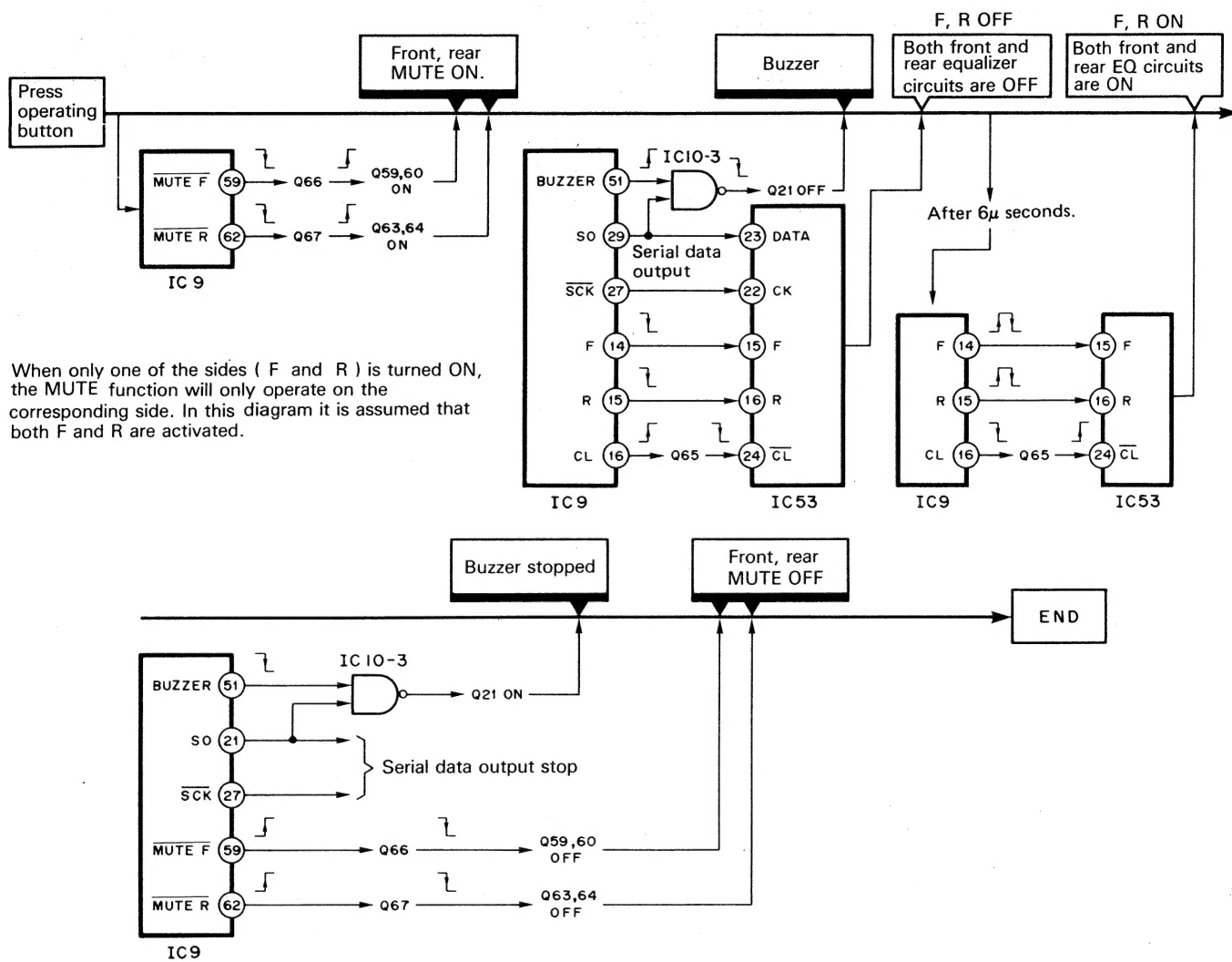
Mark	No.	Part No.	Description
	1.	CZR-162	Owner's Manual (EQ-E303(BK)/US) (English)
		CZR-160	Owner's Manual (EQ-E303(EW) (Swedish, Norwegian, Dutch, Italian)
		CZR-165	Owner's Manual (EQ-E303(EW, ES) (English, French, German, Spanish)
		CZR-161	Owner's Manual (EQ-E303(ES) (Arabic)
			Card (EQ-E303(BK)/US) Card (EQ-E303(BK)/US) Card (EQ-E303(EW)
	2.	CZH-157	Carton (EQ-E303(BK)/US)
		CZH-159	Carton (EQ-E303(EW)

Mark	No.	Part No.	Description
		CZH-158	Carton (EQ-E303(ES)
	3.	CZH-153	Styrofoam
	4.	CZH-163	Styrofoam
	5.	CZH-154	Spacer
	6.		Cover
	7.	CNB-783	Mounting Bracket
	8.	CZE-152	Accessory Assy
	8-1.	CDE-393	Connector (Battery Wire)
	8-2.	CDE-437	Cord
	8-3.	CEA-901	Screw Kit
	8-3-1.	B70-056-A	Nut
	8-3-2.	CBA-101	Screw
	8-3-3.	CBA-102	Screw
	9.	CZH-160	Contain Box (EQ-E303(BK)/US)

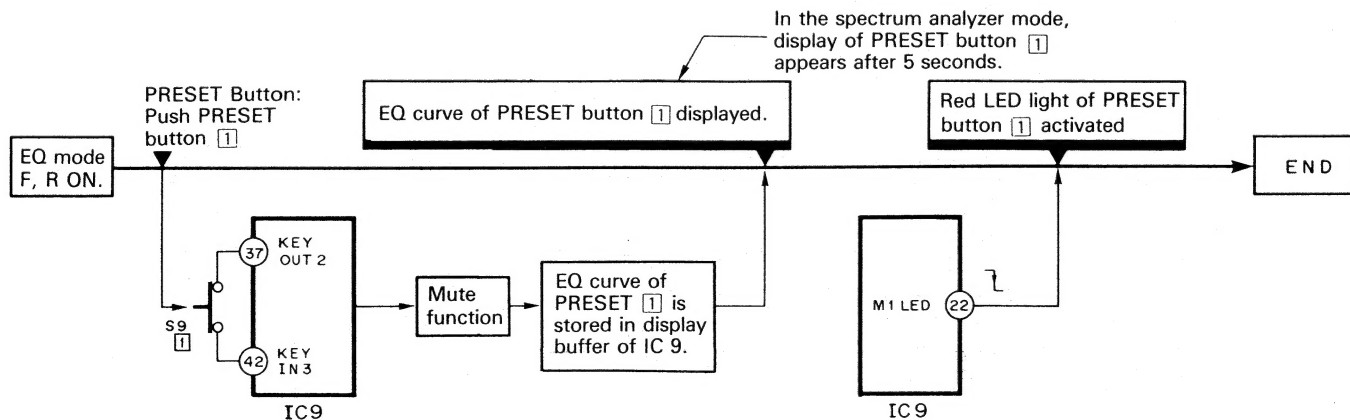
12. CIRCUIT OPERATION

- **Mute Function...**

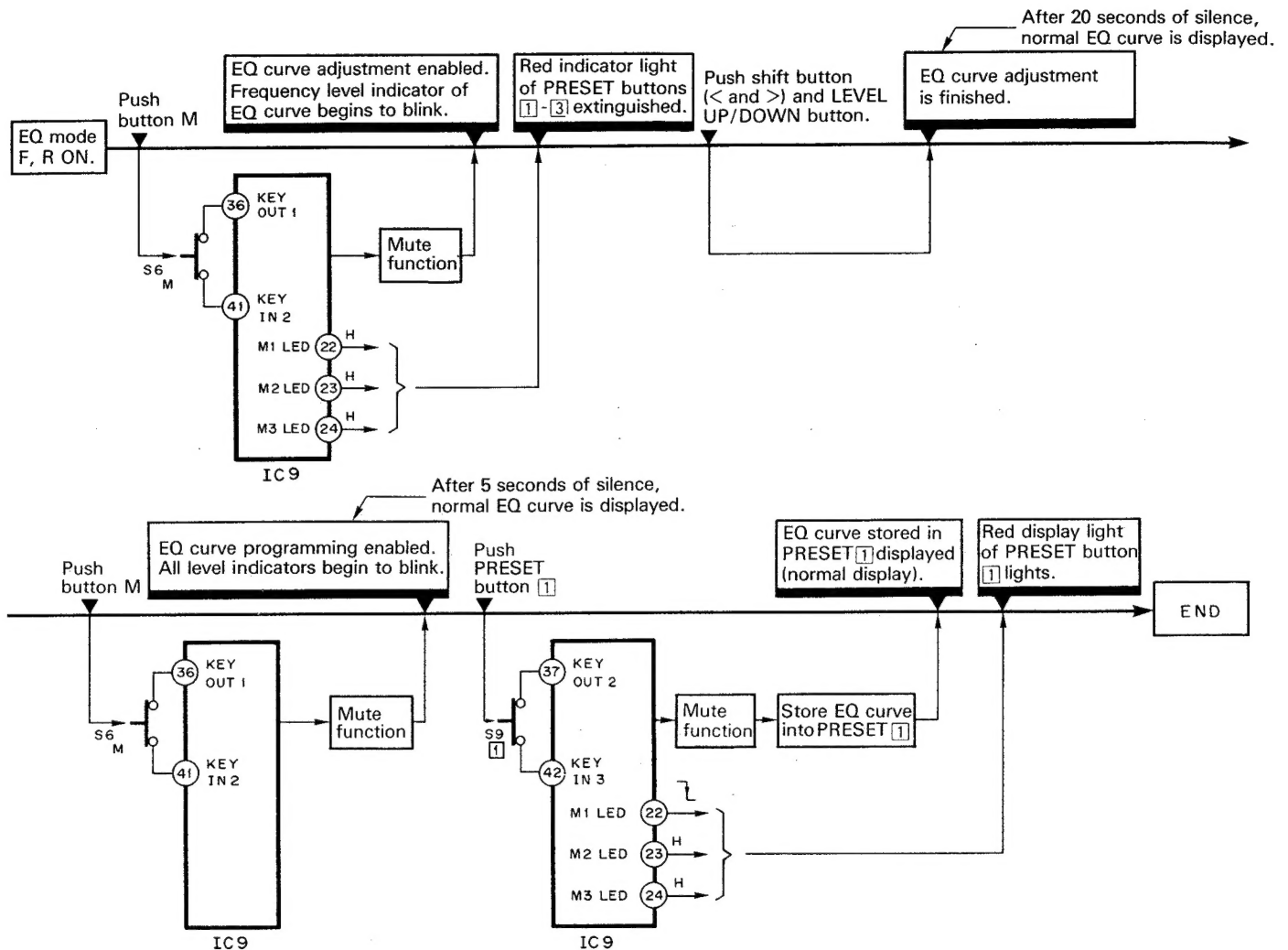
The mute function is activated when any key is pressed. When a key is pressed a soft beeping sound will be heard.



- **PRESET Button:** Push PRESET button **1**



• Programming: (Store in PRESET 1)



• Operation of other buttons

• EQ/SA button

Selects between EQ display and spectrum analyzer display.

If the unit is in the EQ curve display mode when MUTE is activated, the unit switches to the spectrum analyzer display mode; if in the spectrum analyzer display mode, to the EQ curve display mode.

• Frequency shift buttons (<, >)

Frequency is switched after MUTE is activated. When the < shift button is pressed while the far left LED (60Hz) is blinking, the far right LED starts blinking. When the > shift button is pressed while the far right LED (10kHz) is blinking, the far left LED starts blinking.

• Level up/down button (^, v)

Level is adjusted after MUTE is activated. The level cannot be set at a higher or lower level than the level designated to the unit. The buzzer is not generated.

• F and R buttons (Equalizer front and rear buttons)

After MUTE is activated, the equalizer is activated for both the front and rear circuits. However, if the F or R button is pressed after the equalizer has been activated, the equalizer is by-passed.